DOCUMENT RESUME

ED 365 330 IR 054 777

AUTHOR Child, Margaret S., Comp.
TITLE Directory of Information Sources on Scientific Research Related to the Preservation of Sound Recordings, Still and Moving Images and Magnetic Tape.
INSTITUTION Commission on Preservation and Access, Washington, DC.
PUB DATE Sep 93
NOTE 19p.; For related "Directory of Information Sources on Scientific Research Related to the Preservation of Books, Paper, and Adhesives," see ED 319 405.
AVAILABLE FROM Commission on Preservation and Access, 1400 16th Street N.W., Suite 740, Washington, DC 20036-2217 ($10).
PUB TYPE Reference Materials - Bibliographies (131) -- Reference Materials - Directories/Catalogs (132)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Audiodisks; Databases; Films; *Information Sources; *Nonprint Media; Nonprofit Organizations; Photographs; *Preservation; Public Sector; Research; Tape Recordings; Videotape Recordings

ABSTRACT

This document was compiled to provide information about the current work of laboratories and researchers in non-print media in order to help explore and define possible future roles for the Commission on Preservation and Access. Its focus is on information from public sector and non-profit organizations. Summaries of the activities of 18 organizations, ranging in length from one paragraph to one page, are included. The descriptions cover the nature and scope of the organizations, their publications, and research projects related to preservation of photographs, film, and sound media. The directory also describes five databases, eight serials, seven monographs and articles, and three conference proceedings that address these topics. (KRN)

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Directory
of
Information Sources On Scientific Research
Related To
The Preservation Of Sound Recordings, Still And Moving Images And Magnetic Tape

Compiled by
Dr. Margaret S. Child, Consultant
Commission on Preservation and Access

September 1993

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A private, nonprofit organization acting on behalf of the nation's libraries, archives, and universities to develop and encourage collaborative strategies for preserving and providing access to the accumulated human record.

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Compiled by
Dr. Margaret S. Child
Consultant to the Commission on Preservation and Access

Published by
The Commission on Preservation and Access
1400 16th Street, NW, Suite 740
Washington, DC 20036-2217

September 1993

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This paper has been submitted to the ERIC Clearinghouse on Information Resources.

The paper in this publication meets the minimum requirements of the American National Standard for Information Sciences-Permanence of Paper for Printed Library Materials ANSI Z39.48-1992.

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INTRODUCTION

As scholars in the United States turn to what are sometimes called "non-traditional" documentary sources, and as machine-readable formats increasingly are used as the standard method of recording current information, librarians and archivists concerned about the preservation of the documentary record have begun to recognize that far more than our paper-based heritage is threatened by deterioration. All these "other" media have their own specific and idiosyncratic physical and chemical characteristics and are dependent on particular hardware and/or software for access.

This directory was compiled to provide information about the current work of laboratories and researchers in non-print media in order to help explore and define possible future roles for the Commission. Custodians of these materials are confronted by two broad areas requiring preservation research. One area, identified by preservation administrators participating in the Commission's science research initiative, concerns how to prolong the usable life of information on current physical carriers through safe environmental storage and correct handling and use. The second area -- increasingly important as more and more information is stored electronically -- is how to assure access to information when that access is dependent upon hardware and software technology which is itself changing. The life of the medium on which electronic information is stored depends not only on the rate of the medium's physical decay, but also on the life expectancy of the technology used to write to and read from that medium.

For still and moving images on film and for sound recordings, especially those made on various media before the development of audio tape, research is needed on the tradeoffs of continuing to preserve an original version over the long term as compared to transferring the information to a new medium. Because access to magnetic tape is dependent upon rapidly changing hardware and software, its long-term viability as a physical medium is a moot question. The need is therefore for information on its short-term life expectancy and particularly on how to determine when the contents should be migrated forward to avoid loss of data. To put it another way, even though it is agreed that magnetic tape is not now a long-term storage medium, we need to understand the mechanisms driving its physical and chemical deterioration in order to develop the best possible strategies for the preservation of its content. A review of the materials included in this directory suggests a lack of training and educational programs both for preservation professionals wishing to specialize in non-paper-based media and for professional and technical staff in treatment and transfer processes. There also is a lack of selection criteria to determine preservation priorities, particularly in regard to collections of audio and video tapes.

This directory focuses on information from public sector and non-profit institutions, organizations and publications, and does not cover private sector research that is driven principally by production requirements. However, the corporate world is conducting a great deal of relevant research as reported in publications of technical associations such as the Institute of Electrical and Electronics Engineers, the Audio Engineering Society, and the Society of Motion Picture and Television Engineers.

A previous *Directory of Information Sources on Scientific Research Related to The Preservation of Books, Paper, and Adhesives* (OP, available from ERIC as ED 319 045) was issued by the Commission in March 1990. It is the Commission's intention that both directories will prove useful to the preservation and access profession in helping articulate requirements for scientific research.

I. LABORATORIES AND ORGANIZATIONS

American Film Institute. See **National Center for Film and Video Preservation.**

American Institute for Conservation of Historic and Artistic Works (AIC), 1717 K St. NW, Suite 301, Washington, DC 20006; telephone (202)452-9545; Fax (202) 452-9328; Sarah Z. Rosenberg, Executive Director.

AIC is a national membership organization of conservation professionals that provides a forum for the exchange of ideas on conservation and advances the practice of conservation of cultural property through its annual conference, the *Journal of the American Institute for Conservation*, published three times a year, and its education and outreach activities.

AIC's Photographic Materials Group sponsors a program at each annual meeting and also meets separately once a year. Its members include conservators, researchers, curators and others responsible for the care of photographic collections. The group publishes an annual compilation of papers presented at its meetings, *Topics in Photographic Preservation*, available from AIC. It is also developing a Photographic Materials Conservation Catalog.

Eight AIC specialty groups have been working with the AIC Conservation Science Task Force to identify conservation science priorities, and a conservation research resource directory is scheduled to be published in fall 1993. The task force plans to organize into a new subgroup, Conservation Research and Technical Studies, which will meet at each annual meeting.

Association of Moving Image Archivists (AMIA), P.O. Box 27999, 2021 North Western Ave., Los Angeles, CA 90027; telephone (213) 856-7637. Dr. Jan-Christopher Horak, President.

The Association of Moving Image Archivists (AMIA) replaced the Film and Television Archives Advisory Committee (F/TAAC) as the name of this organization in 1991. AMIA now includes over 100 national and local institutions from the U.S. and Canada working in film and television preservation. The National Center for Film and Video Preservation at the American Film Institute (see entry below) serves as the secretariat for AMIA and publishes the quarterly *AMIA Newsletter*. The Association holds annual meetings at one of its member institutions.

Membership includes a broad cross-section of film and television production archives as well as specialized collections, including independently produced film and video art, film and television programs reflecting ethnic and minority experiences, and local and regional film and television programming. Locations include universities and colleges, corporations, film studios, museums, historical societies, state and local archives, public libraries, and other repositories.

Association for Recorded Sound Collections (ARSC), P.O. Box 10162, Silver Spring, MD 20914; telephone (301) 593-6552. Phillip Rochlin, Executive Director.

ARSC was founded in 1966 as an international organization to provide a forum for the development and dissemination of discographic information in all fields and periods of recording and in all sound media. It encourages the preservation of historical recordings and promotes the exchange and dissemination of research and information about them. The *ARSC Journal* is published biannually and includes results of major research and technical developments. ARSC publishes a membership directory every two years that briefly lists members' special interests and research topics.

ARSC's Associated Audio Archives Committee (AAA) works to develop and implement cooperative solutions to common problems confronting archival sound collections. Projects have included a manual of archival cataloging rules, an audio preservation study, and the Rigler and Deutsch Record Index. In 1988, ARSC published a final report on a planning grant received from the National Endowment for the Humanities, *Audio Preservation*, which includes the results of a detailed survey sent to several recorded sound archives comparing how they manage the storage, use, preservation and copying of their holdings. It also includes an indexed and partially annotated 220-page bibliography.

Canadian Conservation Institute (CCI), 1030 Innes Road, Ottawa, Ontario, Canada K1A OC8; telephone (613) 998-3721; fax (613) 998-4721. Charles Gruchy, Director General; J. Clifford McCawley, Director, Conservation Research Services; Raymond Lafontaine, Director, Conservation Services.

CCI is a branch of the Canadian Department of Canadian Heritage established in 1972 to provide conservation treatment, research and training to public museums and galleries in Canada. Although Conservation Research Services (CRS) primarily provides treatment, its conservators are involved in some research projects. Projects also are prompted by service requests for research on specific materials and products. CRS includes three divisions: Analytical Research Services (ARS), Environment and Deterioration (EDR), and Conservation Processes Research (CPR). CCI publishes biennial reviews of its research projects, a newsletter, notes, and technical bulletins.

Research at CCI includes investigations of plastics found in libraries, archives and museum collections. Materials are analyzed to determine their composition, state of degradation, degradation characteristics, and the effects of the undegraded and degraded materials or their degradation products on other objects in the collection.

Conservation Analytical Laboratory (CAL) of the Smithsonian Institution, Museum Support Center, 4210 Silver Hill Road, Suitland, MD 20746; telephone (301) 238-3700. Dr. Lambertus Van Zelst, Director; Gail L. Goriesky and Ann B. N'Gadi, Technical Information Specialists.

CAL engages in research on the conservation and study of museum objects and other materials of historic importance. It also serves as a resource for scientific and technical support to various museums of the Smithsonian as well as to museum professionals at large. With regard to non-print media, CAL established a photographic materials science program in 1988. Fundamental research is conducted on the deterioration of photographic materials, and assistance is given to conservators and curators with material analyses, process identification, and preservation issues. Both modern and historical processes are considered, and a comprehensive approach that considers physical as well as chemical properties is used. For example, the effects of temperature and relative humidity cycling have been investigated using computer modeling and the method of finite element analysis.

The Centre for Archival Polymeric Materials, Manchester Metropolitan University, Chester Street, Manchester, M1 5GD United Kingdom; telephone +44 (61) 247 1432 (Prof. Norman Allen) or +44 (61) 247 1433 (Dr. Michelle Edge); fax +44 (61) 247 1438.

The Centre provides a consultative service to archival and conservation worlds regarding the polymeric materials that are the major constituent of audio-visual media. "It does not matter whether it is cellulose nitrate, cellulose triacetate, or polyester, and the same is true for magnetic media, and for emulsion containing the silver image and gelatine or a

urethane binder and magnetic oxide. In all cases, the binders are polymeric and the support materials are polymeric" (Michelle Edge, "The Deterioration of Polymers in Audio-Visual Materials," *Proceedings of the Third Joint Technical Symposium: Ottawa 1990. Archiving the Audio-Visual Heritage*, p. 29.)

Edge has a background in the deterioration and stabilization of photographic image-related materials. Allen's background is in the degradation and stabilization of polymers, dyes and pigments, and various aspects of the photochemistry of polymers.

Federation Internationale des Archives du Film (FIAF). Permanent Secretariat, rue Franz Merjay 190, B-1180 Brussels, Belgium; telephone +32 (2) 343 0691; fax +32 (2) 343 7622; Head of Secretariat, Brigitte van der Elst.

FIAF was founded in 1938 to bring together institutions from all countries dedicated to the collection and preservation of films of both cultural and historical interest. By film, it means any moving images, whether recorded on film, tape, disk or any other medium. FIAF has 78 institutions in 56 countries. In 1986 it published *Preservation and Restoration of Moving Images and Sound* (under revision) that includes sections on cinema film of all types, magnetic recording of both images and sound, and technical practices, including storage, equipment and staffing. It also provides detailed technical information on the properties of materials and principles of preservation, restoration and transfer. FIAF sponsored the revision of *A Handbook for Film Archives*, edited by Eileen Bowser and John Kuiper, New York, 1991, 200pp, $30.00, ISBN 0-82240-3533-X. Available from Garland Publishing, 1000A Sherman Ave, Hamdon, CT 06514.

The Federation has three specialist commissions: Cataloging, Documentation and Preservation. The Preservation Commission was set up in 1960 to assemble, study and publish the most reliable scientific information related to the storage, preservation and restoration of film and associated sound recordings. It publishes a looseleaf technical manual in three languages that covers basic film handling; the design and layout of film storage facilities; the handling, storage and preservation of nitrate films; the stability of color films; prevention and treatment of bacterial and fungal attacks; and the preservation and storage of magnetic materials.

Federation Internationale des Archives de Television (FIAT). Stik Frykholm, Secretary-General, Television Archives, Sverige Television, S-105 10 Stockholm, Sweden; telephone +46 (8) 784 5760; fax +46 (8) 663 1232.

FIAT, founded in 1977, has some 60 member institutions. The majority are associated with television broadcasters and provide a specialist film and video archive service for their parent organization. Most rely on their companies' technical facilities and staff for copying and preservation services. A number of the larger archives are investing in automatic shelving and retrieval systems, and are increasingly involved with the restoration and transfer of video and film recordings to modern formats.

Getty Conservation Institute (GCI), 4503 Glencoe Avenue, Marina Del Rey, CA 90292-6537; telephone (213) 822-2299.

The Getty Conservation Institute seeks to develop, apply and make available appropriate solutions to conservation problems through research, training, field work, and information exchange. The GCI contributes to scientific knowledge and professional practice through projects that address preventive and remedial conservation of objects and collections, monuments and sites, and historic structures and cities. The Institute employs an in-house

research staff of about 15 scientists at the laboratories in Marina Del Rey plus three at the J. Paul Getty Museum in Malibu. It also manages a variety of contracted research projects in industry, academia, museums or at other conservation research institutions. During its first years, the primary focus of research was on the museum environment. Architectural conservation replaced this emphasis in 1991. Although no projects deal directly with sound recordings, film, or magnetic tape, much of the environmental research is of interest to the broad range of repositories in which such materials are housed. The Institute has published *Research Abstracts of the Scientific Program*, which describes these projects in detail and lists publications. The Institute also has sponsored in cooperation with the Conservation Analytical Laboratory three symposia under the umbrella of the Materials Research Society on "Materials Issues in Art and Archaeology" in which the material sciences of all cultural artifacts are highlighted.

Image Permanence Institute (IPI), 70 Lomb Memorial Drive, Rochester, NY 14623-5604; telephone (716) 475-5199; James M. Reilly, Director.

IPI is a non-profit research laboratory at the Rochester Institute of Technology with a staff of nine persons dedicated to image preservation and education of preservation professionals. It is co-sponsored by the Society for Imaging Science and Technology. Most projects are funded by grants from government or private foundations. It also offers testing and contract research services on commercial products, and its staff participate in committee work on ANSI and ISO standards dealing with the permanence of images. Areas of research related to the preservation of imaging media are:

(1) Silver image stability. IPI has proposed creation of a new ANSI and ISO standard to provide a standard method to measure the effectiveness of chemical treatments that stabilize silver images.

(2) Testing and evaluating storage enclosures. IPI develops and improves methods to evaluate the chemical interactions between storage enclosure materials and photographs. Methods have been developed for specific enclosure components such as inks, adhesives and plastics, as well as for interactions with specific products such as chromogenic color and diazo microfilm.

(3) Effects of air pollution on microfilms. IPI is investigating the effects of four common air pollutants on various types of films used in micrographic applications.

(4) Preservation of nitrate and acetate film base. IPI has completed one major project to collect data showing the role of storage conditions in either promoting or retarding the onset of deterioration in acetate film. It can now graph the predicted amount of time required at a variety of temperatures and RH conditions for fresh triacetate film to attain a free acidity level of 0.5. The Institute has embarked on a second project to investigate additional aspects of this problem.

(5) Dark Stability of Chromogenic and Silver Bleach Color Microfilms. This project has examined the dark keeping dye fading behavior, as well as various emulsion and support characteristics, of the currently available color microfilm products. These include two families of film: Cibachrome silver dye bleach films and Kodak chromogenic color motion picture films.

(6) Isoperms for Color Photography. This project will investigate the optimum storage strategies for color photography. IPI will generate from accelerated aging tests the data necessary to apply the "isoperm" approach - in which the effects of storage temperature and humidity on life expectancy are

quantified over a wide range of possible conditions - to representative types of color photographs. The materials used will be the most common color negative film, color slide film, color print paper, and cinema positive film now on the market.

Reports on completed research are published in professional journals such as the *Journal of Imaging Technology* or the *SMPTE Journal*, in final narrative reports to funding agencies such as the National Endowment for the Humanities or the Commission on Preservation and Access, and incorporated in monographs such as *Care and Identification of 19th Century Photographic Prints* by James M. Reilly, published by Kodak in 1986.

International Association of Sound Archives (IASA), Secretary-General Sven Allerstrand, Director, National Archive of Sound and Moving Image (ALB), Karlavägen 100, PO Box 27890, S-115 93 Stockholm, Sweden; telephone +46 (8) 783 3700; fax +46 (8) 663 1811. In the U.S., Gerald D. Gibson, Motion Picture Broadcast and Recorded Sound Division, Library of Congress, telephone (202) 707-1120, is immediate past-president.

IASA was founded in 1969 to provide a channel for international cooperation between archives and collectors working with sound media of all types. The Association is involved with the preservation, organization and use of sound recordings, and has more than 400 members in 40 countries. The Technical Committee, which is represented on the Technical Coordinating Committee (see below), has published articles in the association's journal, *Phonographic Bulletin*, and organized tutorials.

International Council of Archives (ICA); initial contact for A-V materials, Robert Egeter van Kuyk, Audiovisual Archive of the Netherlands Information Service, PO Box 20006, 2500EA Den Haag, The Netherlands; telephone +31 (70) 356 4110; fax +31 (70) 364 7756.

The ICA was founded in 1948 to provide a forum for archives that handle records of all types, including audio-visual media. The Council has over 700 members from 120 countries grouped into four categories: national and federal archives, associations of archivists, regional and local archives, and individual archivists. The ICA sponsors annual meetings and periodic conferences on specialized topics, for example the International Symposium on Conservation in Archives held in Ottawa, Canada, May 10-12, 1988. The *Proceedings* (1989) include a number of papers dealing with magnetic tape, film, television and sound recordings. Among ICA's specialist commissions and committees is the Audio-Visual Committee, which represents the interests of archives and archivists dealing with recorded images and sound.

International Round Table on Audio-Visual Records, Catherine Pinion, chair, 32 Alexandra Road, St. Albans AL1 3AZ, United Kingdom, Telephone/Fax +44 (727) 833-556.

This is a group of non-governmental organizations (NGOs) recognized by UNESCO that work in different areas of sound and image archiving, but try to coordinate their activities. It evolved from an exploratory meeting held at the 1981 IFLA Annual Congress in Leipzig and held its first meeting in 1982 in Paris. The organizations forming the Round Table are: FIAF, FIAT, IASA, ICA and IFLA.

The **Technical Coordinating Committee (TCC)** is a subcommittee of the Round Table. It was formed after the Second Joint Technical Symposium in Berlin in 1987 at the suggestion of the industrial representatives attending the "Consultation of Users and Manufacturers of A-V Archive Equipment" organized by UNESCO. The TCC is composed of two members of the technical commission of each participating organization (FIAF, FIAT, IASA and ICA), plus a chairman and rapporteur appointed from outside the ranks of the

committee; it works closely with UNESCO and sponsoring organizations. The chair is George Boston, 14 Dulverton Drive, Furzton, Milton Keynes MK4 1DE, United Kingdom; telephone +44 (908) 502 610; Fax +44 (908) 502520; E-mail gboston@ gn.apc.org.

The TCC disseminates information about problems and solutions, produces teaching materials, and suggests and supports research projects. It organized the Third Joint Technical Symposium on "Archiving the Audio-Visual Image", held in Ottawa, May 3-5, 1990. A Fourth Joint Technical Symposium scheduled for Barcelona in August 1993 in conjunction with the 58th General Conference of IFLA was canceled due to low registration, and may take place in Berlin in 1994. Its topic was to have been "Technology and Our Cultural Heritage: Technology's Role in Preserving and Accessing the Memory of the World".

National Archives of Canada, 395 Wellington St., Ottawa, Ontario K1A ON3, Canada. Klaus B. Hendriks, Director of the Conservation Research Division; telephone (613) 995-5138.

During the 1980s both the operations and the research of what was then known as the Picture Conservation Division focused on:

(1) The Duplication of Black and White Negatives. Research was concerned with understanding the sensitometric principles underlying the preparation of duplicate negatives from original black and white negatives, i.e., the principles of tone reproduction. Results were reported by Brian Thurgood, Fred Toll, and Douglas Madeley in the *Journal of Imaging Technology* 1986, 12(4): 185-99.

(2) Recovery of Water-Soaked Photographs. Experiments were conducted by soaking various types of photographs in water under different conditions and drying them in four different ways. The results of the initial series of experiments were reported by Brian Lesser in the *American Archivist* 1983, 46(1):52-68.

(3) Silver Image Stability. Much of the work has not been published, but Dr. Hendriks describes them succinctly in *Preservation Research and Development, Round Table Proceedings, September 28-29, 1992*, pp 135-6, published by the Library of Congress Preservation Directorate.

(4) Gelatin Stability. This research looked at various ways of treating discolored photographs in chemical solutions, examining in detail the reactions known as bleach and redevelopment, and studying the stability of gelatin layers on photographic supports and the effect of hardeners on gelatin. See Klaus Hendriks, Brian Lesser, Jon Steward, and Douglas Nishimura in *Preprints of the AIC 12th Annual Meeting*, 1984, 52-62.

(5) Restoration of Discolored Photographs in Chemical Solutions. See Klaus Hendriks and Lincoln Ross, *Preprints of the AIC 16th Annual Meeting, 1988*, 99-117; and in *Wiener Berichte uber Naturwissenschaft in der Kunst*, 1987-88, 4/5, 372-89.

(6) Hand-Colored Photographs. This project studied the properties of hand-tinted and hand-colored photographs, coupled with an examination of the colors and pigments used. Results were published in Klaus Hendriks and Sebastian Dobrusskin in *Preprints of the 9th Triennial Meeting of the International Council of Museums* (ICOM) (Dresden), 1990, 249-54.

In 1991 the National Archives of Canada published with Lugus Publications of Toronto a manual, *Fundamentals of Photograph Conservation: A Study Guide*, by Brian Thurgood, Joe Iraci, Brian Lesser and Greg Hill. The Conservation Research Division has also contributed the entries "Image Permanence", "Restoration", and "Storage of

Photographs" for the *Focal Encyclopedia of Photography, Third Edition* scheduled for publication by Focal Press, an imprint of Butterworth Heinemann, in 1993. In 1988 it issued a bibliography, *Conservation of Photographic Materials: A Basic Reading List* by Klaus B. Hendriks and Anne Whitehurst, 64pp (32pp each in English and French).

National Archives and Records Administration (NARA). Washington, DC 20408. Lewis Bellardo, Director, Preservation Policy and Services Division; telephone (202) 501-5355; photograph conservator, Sarah Wagner; telephone (202) 501-5360.

NARA contracts with laboratories within the National Institute of Standards and Technology (NIST) and the National Aeronautics and Space Administration to conduct research into the aging characteristics of paper, film, magnetic tape, and disk to determine life expectancies. These projects also seek to identify mechanisms for monitoring the materials for signs of deterioration as well as to determine optimal storage conditions for each type of medium. Most recent NARA preservation research and development activities have been reported in Technical Information Paper No. 7, entitled *National Archives Preservation Research Priorities: Past and Present* (1990, PB 90-206210).

Current NARA research on sound recordings, film, and magnetic tape includes:
(1) Film and Tape Stability. Since 1980, the Archives has funded research at NIST into the aging characteristics of plastics, particularly polyester film, which supports the information-bearing material of both photographic film and magnetic tape. NIST has produced an interim report on storage parameters and has worked on developing a test method for evaluating tape degradation. Research results are reported in an article by Leslie E. Smith, "Factors Governing the Long-term Stability of Polyester-based Recording Media", *Restaurator*, 1991, 12: 201-8.

(2) Post-production Processes to Improve Film Life. NARA, through the National Historical Publications and Records Commission (NHPRC), has provided funding to the Image Permanence Institute to conduct research into the use of sulfiding treatment to protect microfilm, negative duplicating film, and archival prints against oxidative deterioration.

(3) Deterioration of Glass Plate Negatives. Research at NARA has drawn attention to the particular needs and preservation issues associated with negatives produced on unstable 19th century glass. See C. McCabe, "Preservation of 19th Century Negatives in the National Archives", *Journal of the American Institute for Conservation*, 1991, 30:41-73.

(4) Photographic Activity Test. NARA staff are currently working with other interested parties to further improve this test. They are particularly interested in developing a test that determines the suitability of various plastics as enclosures for photographic archives.

(5) Still Photo Cellulose Acetate Negative Duplication. Because of its large holdings of these vulnerable materials, NARA has developed a large-format, polyester base, roll film duplication system. The NARA system uses a five inch roll format camera and has been in full production since early 1993.

(6) Duplication Techniques for Deteriorated Microfilm. NARA staff have developed a variety of techniques for duplicating acetate base microfilm that has deteriorated to the point that it is not possible to use traditional printing equipment. It is creating polyester base preservation copies of film that will be stored under appropriate environmental conditions to safeguard it for several centuries.

(7) Polyester Base Motion Picture Film Pilot. During FY 1993, NARA will begin testing various polyester filmstocks. The goal will be to switch to polyester base film for all preservation duplication by the end of that fiscal year.

(8) Other Research on Photographic Materials:

(a) salvage of water-damaged microfilm, motion picture film, and photographic prints and negatives;

(b) the long-term effects of photographic storage enclosures as they pertain to the use of polyester sleeves, or buffered vs. neutral pH paper enclosures.

(c) development of exhibition standards for photographs in terms of light levels; and

(d) the effect of conservation treatment procedures used on photographs.

National Center for Film and Video Preservation at The American Film Institute, 2021 North Western Ave., Los Angeles, CA 90027; John Ptak, Interim Director and Co-Chair; Gregory Lukow, Deputy Director; telephone (213) 856-7637.

The Center was established in 1983 by the National Endowment for the Arts (NEA) and The American Film Institute (AFI). Along with the traditional responsibilities of the AFI Archives program, it assumed a number of new responsibilities. The center receives annual funds from NEA and raises funds for specific projects. Responsibilities related to this directory are:

- Serve as national center for coordinating U.S. moving image preservation activities.
- Establish relationships between public archives and the film and television industry.
- Develop a comprehensive, national plan for television and video preservation.
- Administer the AFI/NEA Film Preservation Program which annually awards about $350,000 in grants for preservation activities to archives across the country, primarily to copy nitrate film.

The Center has served as the Secretariat of the Association of Moving Image Archivists (formerly the Film and Television Archives Advisory Committee (F/TAAC)) for over 20 years. It serves as the official liaison between the Visual Materials Section of the Society of American Archivists (SAA) and the Association of Moving Image Archivists (AMIA).

In 1986 it completed the "National Film and Video Storage Survey," whose final report contains information on storage and holdings of film and video materials at more than 30 archives. In 1989 it researched and compiled data on the nature and amount of nitrate film holdings still remaining in U.S. public archives, which it presented to the National Film Preservation Board. Holdings statistics were accompanied by an analysis of past and present funding levels and future funding prospects for nitrate film preservation.

In 1991, the Center received a grant from the National Historical Publications and Records Commission (NHPRC) to write and publish a curatorial manual on the

administration and processing of archival TV newsfilm and videotape collections. Gregory Lukow, deputy director of the Center, and Steve Davidson, director of the Louis Wolfson II Media History Center in Miami, FL, (telephone 305 375-4527) are co-directing the project. The manual will be written by a number of experts in the field and edited by Davidson. It is scheduled for publication in April 1994.

National Film Preservation Board, Motion Picture, Broadcasting, and Recorded Sound Division, Library of Congress, Washington, DC 20540; telephone (202) 707-8350.

The National Film Preservation Act of 1988 established the 13-member National Film Preservation Board appointed by the Librarian of Congress. The National Film Preservation Act of 1992 reauthorized the activities of the Board for four years and added a cinematographer, a representative of the theater owners, a film archivist and two at-large members to the Board, a total of 18 members. It also shifted the main focus of the Act to the development of a comprehensive national film preservation program.

The Board agreed its study would define the issues confronting U.S. film preservation, including what has been accomplished to date, existing preservation standards, priorities of major archives and commercial libraries, the geographic distribution of material requiring attention, the capacity of existing laboratory and storage facilities, and access to information on preservation activities.

A report requested by Congress was issued by the Library of Congress in June 1993. It includes the report itself, two volumes containing transcripts of the hearings in Los Angeles and Washington, and a fourth volume with written submissions. The National Film Preservation Board will next turn its attention to the development of a national film preservation plan, to be completed by June 1994. The report identifies four themes to be explored, integrated and prioritized into the national plan. The one most directly concerned with research is as follows:

* Re-framing physical preservation as an integrated "whole film" activity, recognizing the trade-offs of storage and film-to-film copying, examining the adequacy of electronic transfer for some films, and planning how technology will change preservation processes within the next decade.

National Media Laboratory (NML), P.O. Box 33015, St. Paul, MN 55133-3015; telephone (612) 736-8147; fax (612) 733-4340. Dr. William Mularie, Director; Daniel Sprick, Program Manager.

The National Media Lab is a government-focused resource supporting the evaluation, development and deployment of advanced storage media and systems. Located at the 3M Corporation, it works with the private sector to research issues such as stability of magnetic recordings and the reliability of recording systems. NML evaluates recording systems and media for use in government data recording environments, evaluates sites at government installations, and evaluates risk regarding the use of particular systems and media at sites. Its staff will provide advice on the development of a migration path for data to be retained by an institution over the long term.

The NML employs a technical staff of 11 engineers, five of whom are assigned to manage user support projects. Another five manage technology development projects on magnetic recording media, optical recording, magnetic recording theory, recording systems modeling, and imaging systems/output. One is assigned as the NML liaison to the university community. Research projects are conducted by staff from either the commercial sector or universities, under the supervision of and with funding from NML.

The NML publishes a newsletter, *NML Bits*, which includes information about advances in storage media and systems, as well as technical papers, PC databases, and data on diskettes. It holds open semi-annual reviews that provide updates on ongoing research and demonstrations of some of its products. The reviews also serve as a forum to introduce industry participants to government user concerns and encourage productive interactions between users and industry suppliers.

Technical Coordinating Committee. See International Round Table on Audio-Visual Records.

II. SOURCES OF INFORMATION

A. DATABASES

Conservation Information Network (CIN), 4503 Glencoe Avenue, Marina del Rey, CA 90292; telephone (213) 822-2299. CIN facilitates the retrieval and exchange of information concerning conservation and restoration of cultural property. It includes three online databases and an electronic mail system. The Bibliographic Database contains records from all issues of *Art and Archaeology Technical Abstracts (AATA)* and the abstracts of the library of the International Center for Study of the Preservation and the Restoration of Cultural Property (ICCROM), the largest library specific to conservation. The other two databases are a Materials Database on conservation products and a Suppliers Database. Primary network partners are art and architecture-related organizations so the general Bibliographic Database is not terribly useful for non-paper media searches. Users continue to report that CIN is not easy to search.

Library Literature, available online as part of the Wilsondisc and Wilsonline services and on CD-ROM, indexes monographs, reports, proceedings and most periodicals in the field of library and information science, archives and records management and micrography.

Library and Information Science Abstracts, available online via DIALOG, on CD-ROM from Silver Platter, and in print.

Phocus, bibliographic data assembled over many years at the National Archives of Canada. It is the largest online database for photographic conservation in the world and available through CIN.

The National Moving Image Database (NAMID), Margaret Byrne, Project Director. This is one of the primary projects of the National Center for Film and Video Preservation (see section II). NAMID is collecting cataloging and holdings data from U.S. archives, producers, studios, networks, libraries and other repositories to create a comprehensive source of information on the nation's film and television production. The database will include work-specific filmographic information, titles, release and copyright dates, cast and credits, synopses, source credits, production information, genre and subject indexing, and notes. To date, this information has been derived primarily from the American Film Institute's research on commercial films produced in this country. The database also will include holdings level information from both the public and private sector which will contain copy-specific data including extensive physical descriptions of negatives, fine grains, prints, soundtracks, and so forth.

NAMID is entering records on video materials as well as on film. Approximately 1,000 fully cataloged video records were completed in 1992. About 15,000 additional records exist at "inventory level". A number of well-established video repositories such as the Pacific Film Archives are working with NAMID. The project has given priority to artist tapes over documentaries. Information on standards is expected to be included in the future.

B. SERIALS (See also those serials published by organizations listed in Part I above.)

Abbey Newsletter, 7105 Geneva Drive, Austin, TX 78723. Published eight times a year, 1250 subscribers. Although devoted primarily to paper preservation, the newsletter publishes occasional items on non-paper media.

The American Archivist, the quarterly journal of the Society of American Archivists, 600 S. Federal, Suite 504, Chicago, IL 60605, publishes occasional bibliographies on preservation topics. The most recent have been: Mary B. Bowling, "Literature on the Preservation of Nonpaper Materials, Vol 53, No 2, Spring 1990, 340-348; and Hilary A. Kaplan, Maria Holden, and Kathy Ludwig, "Archives Preservation Resource Review, Vol 54, No 4, Fall 1991, 502-44. The latter has special sections on Machine-Readable Records: Audio and Video, 515-17; Electronic, 517-19; and Photographic Materials, 519-520.

Archival Issues, (formerly **The Midwestern Archivist**), semiannual journal published by the Midwest Archives Conference (MAC), Kevin Leonard, MAC Secretary/Treasurer, University Archives, Northwestern University, Evanston, IL 60208-2300. Vol XVI, No 1, 1991 was devoted almost completely to the subject of preservation of sound archives. It included a bibliography by Christopher Ann Paton, "Annotated Selected Bibliography of Works Relating to Sound Recordings and Magnetic and Optical Media", 31-47.

Conservation Administration News (CAN), published quarterly by The University of Tulsa Libraries, McFarlin Library 600 South College Avenue, Tulsa, Oklahoma 74104. **CAN** focuses primarily on the preservation of paper, but reports on preservation and conservation developments related to non-paper media on an *ad hoc* basis.

Infinity, Newsletter of the SAA Preservation Section, issued three times a year. The section also publishes an annual compilation of all papers on preservation/conservation topics given at the SAA annual conference.

Library Resources & Technical Services, published quarterly by the American Library Association (ALA), Association for Library Collections and Technical Services (ALCTS), 50 East Huron Street, Chicago, IL 60611. Includes an annual bibliography of preservation literature which includes a section on non-print/non-paper materials.

Library Technology Reports, vol 27, No 1, January-February 1991, 116 pp, is devoted to "Stability, Care and Handling of Microforms, Magnetic Media and Optical Disks", by William Saffady. This ALA publication (see address above) provides a thorough overview of recent research and current practice. It includes an extensive bibliography.

Restaurator, published quarterly by Munksgaard International Publishers Ltd., PO Box 2148, KD-1016, Copenhagen K Denmark. Edited by Helmut Bansa.

C. MONOGRAPHS AND ARTICLES

Deirdre Boyle, *Video Preservation, Securing the Future of the Past*, Media Alliance c/o Thirteen/WNET, 356 West 58th St. New York, NY 10019; telephone, (212) 560-2919. This report of a June 1991 symposium cosponsored by the nonprofit membership organization, Media Alliance, and the New York State Council on the Arts, Electronic Media and Film Program includes a section on preservation activities and a list of video preservation resources.

Alan Calmes, *New Preservation Concern: Video Recordings*, Commission on Preservation and Access Newsletter, no. 22, April 1990. This report discusses methods for the preservation and long term survival of polyester tape and includes tips for extending the life of video recordings.

Kathryn Luther Henderson and William T. Henderson, editors, *Conserving and Preserving Materials in Nonbook Formats*, University of Illinois, Graduate School of Library and Information Science, Urbana-Champaign, Illinois, 1991. This publication contains papers presented at the thirtieth Allerton Institute. It includes "Preservation and Conservation of Sound Recordings" by Gerald Gibson of the Library of Congress, "Moving Images: Conservation and Preservation" by Susan Dalton of the National Center for Film and Video Preservation, "The Preservation, Storage and Handling of Black-and-White Photographic Records" by Klaus B. Hendriks of the National Archives of Canada, and "Color Photographs and Color Motion Pictures in the Library: For Preservation or Destruction?" by Henry Wilhelm, as well as an introductory chapter on "Needs and Potential Solutions in Conservation" by Lambertus van Zelst, Director of the Conservation Analytical Laboratory at the Smithsonian Institution.

James Reilly, *Final Report to the Office of Preservation, National Endowment for the Humanities, Preservation of Safety Film*, available from the catalog of the Association for Information and Image Management (AIIM), 1100 Wayne Avenue, Suite 1100, Silver Spring, MD 20910-5699. This 102-page report describes the procedures and results of a three-year research effort to explore the influence of the storage environment on the deterioration of the plastic supports of cellulose acetate photographic and cinematic films. The research sought to measure the rate of deterioration in the major types of safety film, quantify the role of temperature, humidity, and their interactions, and to improve preservation by putting forward recommendations for optimum storage conditions.

Gilles St.-Laurent, *The Care and Handling of Recorded Sound Materials*, Commission on Preservation and Access, September 1991, OP, available from ERIC as ED 338 323. Reprinted in the *ARSC Journal* 23, no.2 (Fall 1992); 144-157. This 14-page report provides advice for materials in collections, focusing on the nature and composition of the recording media.

Alan Ward, *A Manual of Sound Archive Administration*, Gower Publishing Company Ltd., 1990, 288 pp. This publication includes a chapter on conservation of sound archives and a brief annotated bibliography as well as appendices containing model codes of practice on storage, handling, playback, and transfer. Alan Ward is an archivist at the National Sound Archive

of Great Britain and has been secretary of the British Association of Sound Collections and chairman of the Oral History Society. His book includes information on current British and Commonwealth research and practice that may be less well-known to U.S. readers.

Henry Wilhelm with Carol Brower, *The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures*, Preservation Publishing Company, Grinnell, Iowa, 1993, 744 pp. This is the newest comprehensive source on all aspects of the preservation of color film and also contains useful information on black and white film. It is heavily annotated and illustrated and well indexed.

D. CONFERENCE PROCEEDINGS

Proceedings of the Third Joint Technical Symposium: Ottawa 1990. Archiving the Audio-Visual Heritage, 1992, ISBN 1 873902 02 6, 192pp, $40.00, available from George Boston, 14 Dulverton Drive, Furzton, Milton Keynes, MK4 1DE United Kingdom. At this symposium, concerns about the chemical stability of carriers were beginning to dominate the thoughts of many archivists. Delegates discussed the need to copy images and sound stored on carriers previously thought to be indestructible, and the usefulness of digital recording techniques for this purpose. Papers were presented on the future use of computerized work stations for digital recording. Sessions covered: Problems Facing Archives and Long Term Stores of Audio-Visual Material in Countries with Adverse Conditions; The Breakdown of the Components of Signal Carriers with Age; New Carriers; Do We Have Format Standards Suitable for the Long Term Storage of Audio-Visual and Film Materials?; The Practice of Signal Carrier Restoration; and Is a Multi-Media Format or System for Audio-Visual Material a Practical Proposition?

Proceedings of the Second Joint Technical Symposium: Berlin 1987. Archiving the Audio-Visual Heritage, 1988, available from the Stiftung Deutches Kinemathek, Pommernallee 1, D-1000 Berlin 19, Germany. The program was designed to present three areas: preservation (or restoration); conservation; and the obsolescence of hardware, software and materials in each of the media involved -- film, video and sound. The main themes were discussed by the three associations of film, television and sound archives to indicate similarities in the problems presented to the archivists by the materials.

Preservation Research and Development: Round Table Proceedings, September 28-29, 1992, June 1993, edited by Carrie Beyer, National Preservation Program Office, Library of Congress, Washington, DC 20540. The mission of the round table was to "define a new domain, a new area of competence in a field that we should call preservation science." An introductory session enabled prominent research organizations to report on areas of scientific inquiry. Other sessions covered electronic image management, environmental effects, mass preservation, and imaging media preservation.

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